CHARACTERIZATION OF A WATER DEFICIT STRESS INDUCED GENE (LP5) OF LOBLOLLY PINE

G. Jagadeeswaran, Ronald J. Newton, and Carol A. Loopstra [1]

Woody plants are subjected to many environmental stresses, of which Water Deficit Stress (WDS) is the most common. Earlier studies on pine seedlings subjected to WDS, have resulted in the isolation of several WDS induced cDNA clones. Our current research efforts are focused on characterizing the regulation and functional role of these genes, by determining the promoter and regulatory elements that control gene expression and examining the gene products at the cell/tissue level. One of these WDS responsive clones, referred to as 1p5, encodes a glycine rich protein, a class of proteins characterized by their repetitive primary structure and up to 70% glycine. Based on the amino acid sequence, we predict LP5 to be a cell wall protein that might be involved in some defense function. The promoter of 1p5 was able to drive uid expression in transformed tobacco. We are testing full length and deletion constructs of the promoter region, to identify the location of regulatory elements required for expression as well as those involved in induction. In vitro translation of LP5 protein has been accomplished in E.coli and polyclonal antibodies generated. Localization studies are underway. Constructs with the 1p5 gene fused to the 35S promoter were transformed in tobacco towards overexpression. The possible role of this protein in modifying cell wall properties in transformants will be analyzed.

[1] Department of Forest Science, Texas A&M University, College Station, TX 77843-2135